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(71) Applicant

The Hepworth Iron

Company Limited

(United Kingdom),

Hazlehead, Stocksbridge,

Sheffield S30 5HG

(72) Inventor

John Benjamin Glover

(74) Agent and/or Address for
Service

Marks & Clerk,

57—60 Lincoln's Inn

Fields, London WC2A 3LS

(54) **Pipe couplings—cable supports**

(57) Cleats or eyes 7, 8, provided at pipe joints for supporting cables, can be integral extensions of conventional pipe coupling components for example plastics coupling sleeves 2. Alternatively a cable eye can be integral with an L-shaped arm or hook designed to be inserted into the L-section space which normally exists between the spigot and socket in a spigot and socket pipe joint.

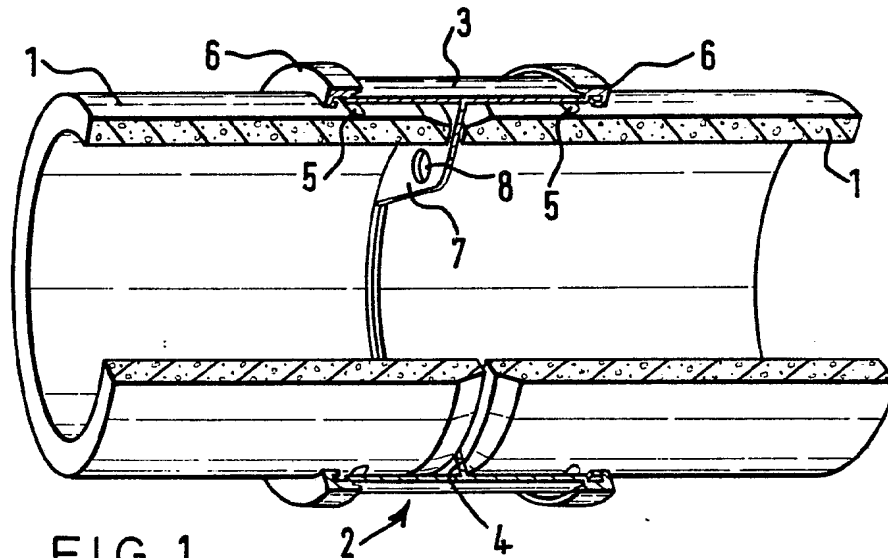
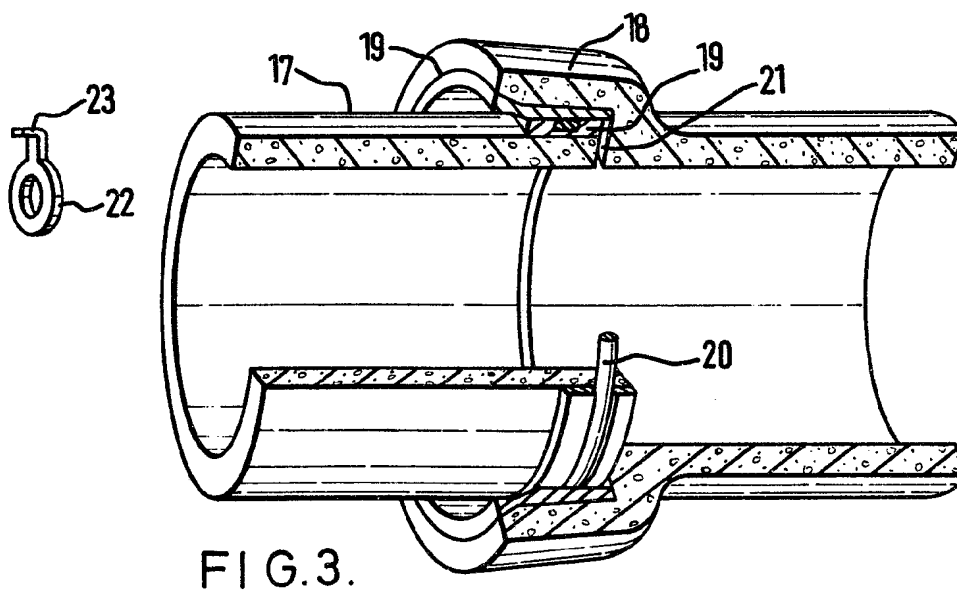
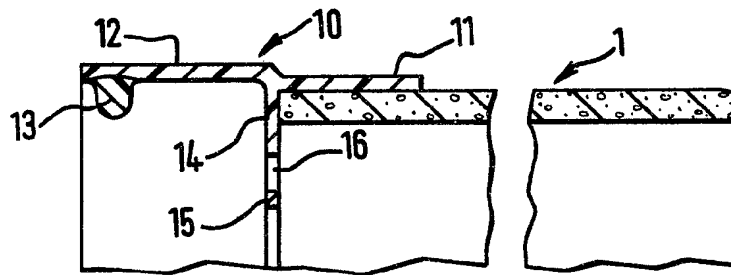
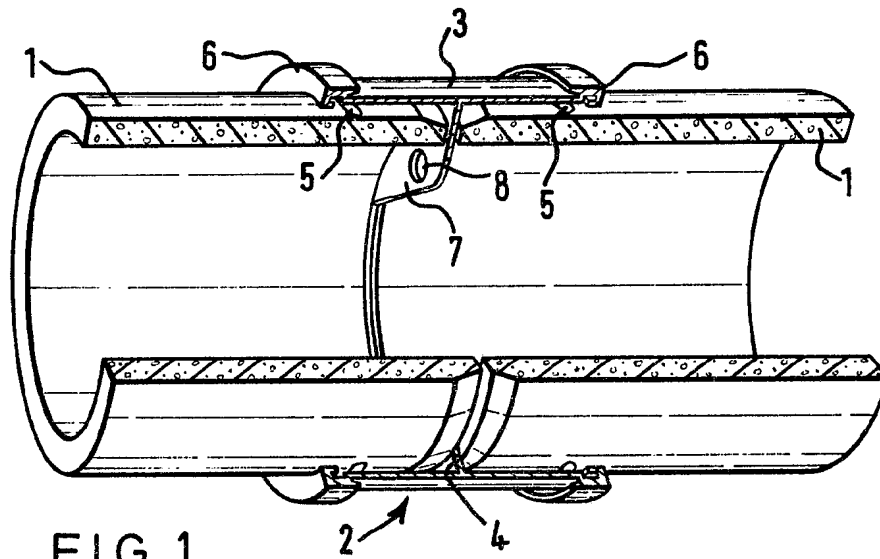


FIG. 1.

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SPECIFICATION

Improvements relating to drainage systems

This invention relates to drainage systems and other piping and ducting systems, and aims to increase the usefulness of such systems. The invention is particularly but not exclusively applicable to underground drainage piping.

The provision of electrical and electronic services involves overhead cables, which are unsightly, or buried cables which are costly. The provision of new cable services in towns is particularly costly and disruptive. A major item of cost in the currently proposed installation of cable television and related services is the provision of the distribution cables.

According to the present invention, drainage pipes or the like are provided with cable-locating means, for example cleats or loops, at the pipe joints.

Drainage pipes and the like are usually made in lengths, for example of clay or other mineral material or of plastics, fastened together by spigot and socket joints or by coupling sleeves. It is cheap and easy to modify the coupling or jointing means to provide a cable-holding loop or the like which in use projects into the pipe system. Cables can then be laid inside the pipes, either when the pipes are laid or subsequently using remote handling and monitoring equipment. In the case of cable installation in a previously laid pipe system, access to the pipe system at relatively close intervals will be required, but in many cases the access points normally provided in, for example, a drainage system will be adequate for the insertion of cables and the remote handling and monitoring of these in the insertion process.

According to one embodiment of the present invention, a cable suspension loop or lug is provided integrally with a locating or registration flange or rib such as is conventionally provided in plastics pipe coupling sleeves and sockets. This would require only minor modification of existing plant for moulding plastics coupling sleeves and sockets, and would involve little or no change in the way these are used in laying pipe systems.

According to another embodiment of the invention, a cable-suspension loop or the like is provided in a separate clip with a fixing arm designed to fit in the space which commonly exists between the pipe ends at a pipe joint. Such a device can be installed as the pipes are laid or could be installed in existing pipe systems using remote handling equipment, provided that the clip is so designed that it can be forced into the space existing at pipe joints, which is narrow if the pipes have been correctly laid. This is usually an L-section space at the pipe joint, and accordingly an L-shaped clip fitted into this will be relatively secure.

Embodiments of the invention are illustrated by the accompanying drawings, in which:

Figure 1 is a sectional view in perspective of a pipe joint using a coupling sleeve,

Figure 2 is a cross section of a pipe with a

plastics joint socket, and

Figure 3 is a section in perspective of a spigot and socket pipe joint.

Figure 1 shows a pair of plain-ended pipes 1 made of any suitable material for example clay, pitch fibre, asbestos or thermoplastics such as p.v.c., polyethylene or polypropylene. These pipes are jointed end to end by plastics pipe coupling 2, made for example of the above-mentioned plastics. The pipe coupling comprises a sleeve 3 with a central internal register flange 4 to ensure that the pipe joint is substantially symmetrical. At each end of the sleeve, an elastomeric sealing ring 5 is held in place for example by locking rings 6, so as to provide a fluid-tight seal around the pipe ends. Pipe couplings of this type are well known.

In accordance with the present invention, the register flange 4 is extended inwardly throughout its circumferential extent or locally so as to extend into the cross section of the pipe bore as shown at 7, and the inwardly projecting part constitutes a cable-retaining loop or cleat, for example having one or more openings 8. To minimise obstruction of the bore, the inward projection of the register flange should be as small as is compatible with the required amount of cable accommodation and adequate cable-holding strength. Thus, the inward extension may be no more than a thin loop of material integral with a substantially conventional register flange. Such a loop must however be sufficiently rigid to hold its shape after installation, particularly if cable is to be installed after the pipe system has been laid, by remote handling. When the couplings are installed, a little extra care will be needed to ensure that successive cable-receiving loops or holes are substantially in line, but apart from this, the pipes and pipe couplings are installed in the same way as with present conventional pipe couplings.

Figure 2 shows a pipe length 1, on one end of which is a plastics coupling socket 10 for making a spigot and socket pipe joint. This has a skirt 11 which fits over the pipe end and is held in place for example by a force fit and/or an adhesive or by being moulded on to the pipe end. Extending away from the skirt is a socket portion 12 of greater internal diameter, with a sealing ring 13 at its outer end, held in place for example by a locking ring or an adhesive, or by the sealing ring and socket being integrally moulded. The plastics socket has an internal register rib or flange 14 abutting on the end face of the pipe. This has an internal extension 15 with an opening 16, forming a cable-holding element similar to that described in relation to Figure 1. Such a socket requires only modification of the injection moulds used for making plastics sockets without cable holders, and is used in substantially the same way as conventional plastics pipe sockets, except that, as previously mentioned, the pipes should be laid so that successive cable holders are substantially in line.

The previously described pipe couplings and sockets are suitable for new pipe systems. The invention is however applicable to existing pipe

systems.

Except in pipe systems with grouted joints, pipe joints commonly provide a gap between the pipe ends, and/or between the pipe ends and a pipe coupling sleeve or socket, this gap usually being substantially L-shaped in axial section. An example is shown in Figure 3, which shows a spigot and socket joint between a spigot end 17 of a pipe and a bell end 18 of another pipe. The joint comprises sealing layers 19 on the spigot end and inside the bell, and an elastomeric sealing ring 20 trapped between these. It will be seen that there is an L-section gap 21 between the end face of the spigot pipe end 17 and the bottom of the bell socket, and between the inner and outer sealing layers 19, within the region sealed by the ring 20.

To enable cable to be placed in such pipes, we provide a cable ring or loop 22 with an integral L-shaped clip 23 of suitable shape and dimensions to fit into the gap 21. Such cable holders can be installed in the pipe joints when the pipes are laid, by being placed between the pipe ends as these are fitted together. However, such a cable holder can also be installed subsequently in existing pipe systems using remote handling equipment. For this purpose, the clip or arm 23 is stiffly flexible so that it can be pushed endwise into an existing L-shaped gap 21 and then hold itself in place. To facilitate such insertion, the clip may have a thickness somewhat less than the normal gap width, but have ribs on its surface, extending radially on the radial part of the clip and longitudinally on the longitudinal part of the clip. If more than one cable is to be carried, several such clips may be inserted in each joint, or larger clips may be used, having more than one hole, or an elongated slot for receiving the cables. Such cable holding clips can be made of any suitable material for example plastics such as those mentioned above. They can also be made in conjunction with spigot and socket joints comprising conventional plastics sockets (that is, like Figure 2 but omitting the cable holder 15, 16). They can also be used in conjunction with conventional pipe couplings similar to that of Figure 1 but omitting the cable holder 7, 8. In the latter case, the clip is inserted between one pipe end, and the central register flange and adjoining internal surface of the pipe coupling.

50 CLAIMS

1. A device for locating electrical or communicating cables in a pipe system, comprising a receptacle for the cable attached to a retaining element adapted to engage at least one pipe at a joint between pipes.

2. A device as claimed in claim 1 for use with a spigot and socket pipe joint, in which the retaining

element is generally L-shaped for fitting in the radial and axial gap between the spigot and the socket.

3. A device as claimed in claim 1 in which the retaining element is a pipe-coupling component or a part thereof.

4. A device as claimed in claim 3 in which the pipe coupling component is a coupling sleeve for receiving respective pipes end to end and the receptacle for the cable projects inwards from an intermediate region of the sleeve so as to lie between the two pipe ends.

5. A device as claimed in claim 3 in which the pipe coupling component is a socket to be fitted as a pipe end for receiving a spigot pipe end and the receptacle for the cable projects inwards from an intermediate region of the socket so as to lie at the end of the first mentioned pipe end.

6. A device as claimed in claim 3, 4 and 5 in which the cable receptacle is integral with an internal locating or registration member of the coupling component.

7. A device as claimed in any of claims 1 to 6 in which the cable receptacle is a cleat or a loop.

8. A pipe coupling sleeve for receiving two pipes end to end, of plastics material, having sealing means at opposite ends and an intermediate internal registration member arranged to lie between the pipe ends for ensuring correct location of the sleeve on the pipes, which member has at least one inward extension arranged to lie within the pipe bore and provided with an aperture for receiving a cable.

9. A pipe coupling socket of plastics material having a first end region adapted to form a socket for receiving a pipe end in the manner of a spigot and socket joint, a second end region adapted to be secured to an end of a pipe to form a socket-ended pipe, and an internal registration member at the junction of the first and second end regions for locating the plastics socket correctly on the last-mentioned pipe end, which member has at least one inward extension arranged to lie within the pipe bore and provided with an aperture for receiving a cable.

10. A device for locating cables in pipes, substantially as herein described with reference to Fig. 1, Fig. 2 or Fig. 3 of the drawings.

11. A piping system comprising a plurality of pipes coupled together at pipe joints, and cable-locating means mounted in the pipe joints for receiving electrical or communications cables or the like.

12. A piping system as claimed in claim 11 in which the cable-locating means are as set forth in any of claims 1 to 10.

13. A piping system as claimed in claim 11 or 12 constituting a drainage system.